Claims:

1.   A comparator for an amplifier, the comparator comprising:

        switch means which alternately couples a first and second detector means to

5   the input and output of said amplifier, the amplifier output being normalised to the

        amplifier input signal level and time aligned,

        difference means arranged to determine an error value corresponding to the

        difference between said amplifier input and output;

        digital signal processing means arranged to determine said error values as a

10   function of said amplifier input signal level.

2.   A comparator as claimed in claim 1 wherein the difference means is a

        difference amplifier coupled to the outputs of said detectors.

15   3.   A comparator as claimed in claim 2 further comprising a DC offset applied to

        the output of a detector.

4.   A comparator as claimed in claim 1 wherein the output of each detector is

        coupled to the digital signal processing means and the difference means is

20   implemented by the digital signal processing means.

5.   A comparator as claimed in claim 1 wherein phase detection comprises a

        switch matrix having a 90 degree hybrid coupler and arranged to switch the hybrid

        coupler between said detectors and amplifier such that said error represents phase

25   error.

6.   A comparator as claimed in claim 1 wherein said digital signal processing

        means averages said error values over a predetermined period for each said

        amplifier input signal level.

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7.   A comparator and pre-distorter arrangement for an amplifier, the pre-distorter

        coupled to the input of the amplifier, and the gain/phase comparator coupled to the

        pre-distorter; the comparator having:

        switch means which alternately couples a first and second detector means to

35   the input and output of said amplifier, the amplifier output being normalised to the

        amplifier input signal level and time aligned,

difference means arranged to determine an error value corresponding to the difference between said amplifier input and output;

digital signal processing means arranged to determine said error values as a function of said amplifier input signal level.

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8.   An arrangement as claimed in claim 7 wherein the pre-distorter averages the error values for each said amplifier input signal level.

9.   An arrangement as claimed in claim 7 wherein the pre-distorter has gain or

10   phase correction memory comprising gain or phase correction values as a function of amplifier input signal level, the pre-distorter being arranged to output said gain or phase correction values dependent on detected amplifier input; the pre-distorter further arranged to adapt said gain or phase correction values dependent on said error values determined by said comparator.

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10.   An arrangement as claimed in claim 9 wherein the pre-distorter further comprises a second gain or phase memory comprising gain or phase correction values as a function of the amplifier input, the pre-distorter arranged to alternately switch between said first and second memory such that one said memory is used to

20   output said correction signal whilst the correction values in the other memory are adapted.

11.   A method of determining the gain or phase error between the input and output of an amplifier, the method comprising:

25   detecting the input and output of said amplifier, the amplifier output having been normalised to the amplifier input and time aligned, wherein the means of detection are alternated between the amplifier input and output;

determining an error value corresponding to the difference between the detected amplifier input and output;

30   determining error values as a function of amplifier input signal level.

12.   A method as claimed in claim 11 further comprising averaging said error values over a predetermined period.

35   13.   An amplifier having a pre-distorter coupled to the input of the amplifier, and a gain/phase comparator coupled to the pre-distorter; the comparator having:

switch means which alternately couples a first and second detector means to the input and output of said amplifier, the amplifier output being normalised to the amplifier input signal level and time aligned,

difference means arranged to determine an error value corresponding to the
5   difference between said amplifier input and output;

digital signal processing means arranged to determine said error values as a function of said amplifier input signal level.

14.   A base station comprising an amplifier having a pre-distorter coupled to the
10   input of the amplifier, and a gain/phase comparator coupled to the pre-distorter; the comparator having:

switch means which alternately couples a first and second detector means to the input and output of said amplifier, the amplifier output being normalised to the amplifier input signal level and time aligned,

15   difference means arranged to determine an error value corresponding to the difference between said amplifier input and output;

digital signal processing means arranged to determine said error values as a function of said amplifier input signal level.